

CHAPTER 3

SYSTEMATIC 1:100 000-SCALE MAPPING OF EASTERN LABRADOR

This stage marked the start of publication of geological maps for eastern Labrador in latitude/longitude-defined blocks, thus avoiding gaps or overlaps in coverage. The start of the period was also when the author joined the Geological Survey of Newfoundland and Labrador.

The systematic mapping of eastern Labrador is subdivided here into six stages that correlate with funding structure (Figure 3.1). These were, i) Canada–Newfoundland Mineral Development Subsidiary Agreement 1979–1981 (MDA I), ii) Canada–Newfoundland Cooperative Minerals Program 1982–1983, iii) Canada–Newfoundland Subsidiary Agreement on Mineral Development 1984–1989 (MDA II), iv) Canada–Newfoundland Agreement on Mineral Development 1991–1995 (MDA III), v) Provincial funding (1996–2000), and vi) Provincial funding (post-2000). The acronym ‘MDA’ (Mineral Development Agreement) was the vernacular term applied to the agreements.

3.1 MDA I (1979–1981)

Between 1979 and 1981 in eastern Labrador during MDA I, the areas mapped were NTS map areas 13J/east, 13I, 13G/northeast and 13H/north (Gower, 1980, 1981; Gower *et al.*, 1981, 1982b). In 1979, mapping was carried out using a series of mobile float camps, plus a 10-day period at a cabin on Lake Michael, from which helicopter operations were conducted. Mapping was mostly carried out by a two-person team (the author and his assistant), but for part of the field season, this was augmented by A. Doherty and assistant, after finishing mapping in the Adlavik Islands area (Doherty, 1980). D. Bailey (then senior geologist for the Labrador Mapping Section), also completed some traverses in the region following completion of a study in the Double Mer area (Bailey, 1980).

In 1980 and 1981, operations, including helicopter-positioned ground traverses, were based in Rigolet and Cartwright, respectively. Float camps and fixed-wing fly camps were used in areas distant from communities. Operating from a coastal community conferred huge operational benefits, especially in reducing expenditures in positioning helicopter fuel, but also in reducing costs for positioning personnel, equipment and supplies, in providing a

main-line power source (enabling daily slabbing and staining of rock samples, for example), shelter to allow efficient use of bad-weather days and also providing a morale-boosting comfort level. The field-party structure, consisting of project geologist (the author), two (mapping) senior assistants, four junior assistants, and helicopter personnel, was destined to continue as a preferred mode of operation for several years. The resultant preliminary geological maps during this period were produced as coordinate-bounded blocks, although areas covered each summer were not so regular. This partly reflected incomplete adjustment to the ‘quadrant’ approach, but was also due to access logistics. Parts of NTS areas 13G/08 and 13 were compiled from the 1975 mapping of R. Emslie in order to achieve map-boundary regularity.

3.2 COOPERATIVE MINERALS PROGRAM (1982–1983)

During the Cooperative Minerals Program, two projects were completed in eastern Labrador. The first, in 1982, was carried out in the Double Mer area (NTS map areas 13G/15, 16 and 13F/16) by Erdmer (1983, 1984) leading a five-person party (one senior assistant and three junior assistants) that was based at a tent camp on the shore of Lake Melville near Charley Point. In addition to the three NTS map areas noted above, Erdmer (1984) also compiled NTS map areas 13G/09 and 10 from the mapping of R. Emslie.

The second project, in 1983 (Gower, 1984, 1986), was carried out by the author with two junior assistants, based at Brinex’s then-extant exploration camp at Melody Pond. As the area to be mapped is inland (NTS map areas 13J/03, 04, 05, 06, 13K/01, 08) and very poorly exposed, it was done almost entirely by helicopter – except for some ground traverses in the Double Mer White Hills area. During part of the field season, R. Klassen of the Geological Survey of Canada shared the camp and helicopter while conducting surficial-deposit studies in the area (Klassen and Thompson, 1993). The western two NTS map areas (13K/01, 08) were included in the project to infill a gap between other eastern Labrador mapping and that completed by Ryan (1984) farther west.

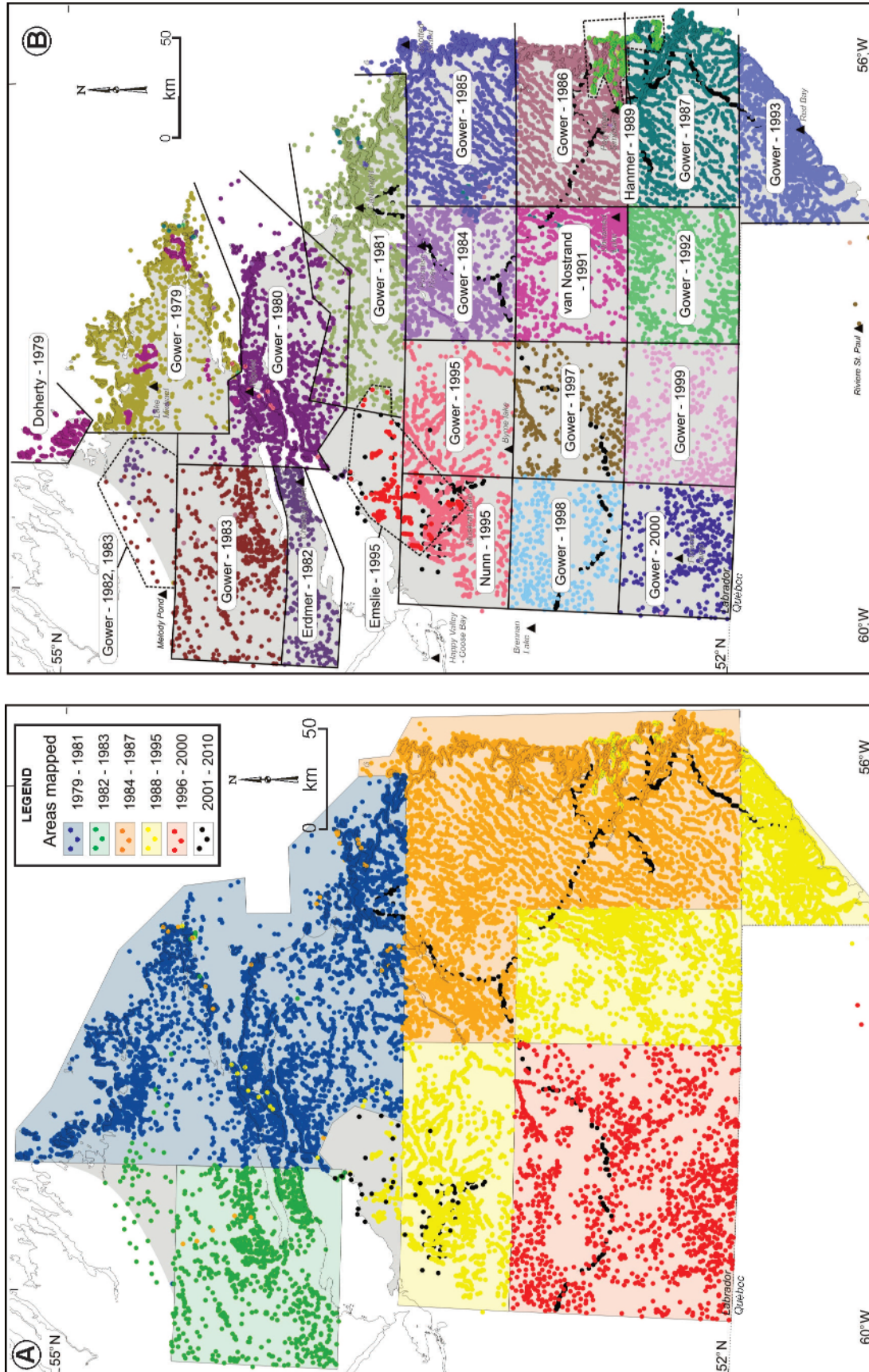


Figure 3.1. Systematic 1:100 000-scale mapping of eastern Labrador. A. Data stations and areas colour coded according to six time-related stages of mapping. Non-matching dots indicate data collected outside the defined time period. B. Data stations and areas colour coded according to project year from 1979 onward. Data captured from Geological Survey of Canada projects carried out by Emslie (1976) and Hammer and Scott (1990) are also shown.

3.3 MDA II (1984–1989)

Between 1984 and 1989, major advances were made in 1:100 000-scale mapping in eastern Labrador (Gower *et al.*, 1985, 1986b, 1987, 1988). Four projects were completed using the 7-person field-party structure (plus helicopter pilot) and were based successively in Paradise River (1984), Paradise River and Spotted Island (1985), and Port Hope Simpson (1986 and 1987). Areas covered were NTS map areas 13H/south, 13A/east, 3D and 3E. The 1984 project was the last in eastern Labrador to use fixed-wing aircraft to position camps on lake shores, and from which ‘rose-petal’ traverse loops were conducted. Ground crews in all subsequent projects were dropped off and picked up by helicopter. In 1985, portable radios were used for the first time, enabling oral communication with the helicopter pilot and greatly reducing the time (hence cost) required to locate and retrieve field crews on the ground at the end of the day.

3.4 MDA III (1991–1995)

No systematic mapping was carried out in 1990, but resumed in 1991. Between August 1990 and July 1991, the author was resident at the University of Gothenburg in Sweden as a Guest Researcher, so the 1991 project (NTS map area 13A/northwest) was led by van Nostrand (van Nostrand, 1992; van Nostrand *et al.*, 1992) as part of a five-person team based at a tent camp in the southeast part of the map region. After the author returned from Sweden, he joined the project during its final weeks.

In 1992, the adjacent area to the south (NTS map area 13A/southwest) was mapped (Gower *et al.*, 1993), based in Port Hope Simpson, followed, in 1993, by mapping in southeasternmost Labrador (parts of NTS map areas 12P and 2M), based in Red Bay (Gower *et al.*, 1994). No mapping was carried out in eastern Labrador in 1994. It was during this period that GPS devices were introduced, which greatly aided field navigation in wooded areas, although, initially, they were not sufficiently reliable to provide accurate spot locations. It was also at this time that field entry of information into digital databases was started.

During the final year of MDA III, in 1995, two 1:100 000-scale mapping projects were carried out in eastern Labrador in the Mealy Mountains region under the leadership of the author (NTS map area 13G/southeast) and his colleague G. Nunn (NTS map area 13G/southwest). One senior assistant (van Nostrand) was shared between both projects (Gower and van Nostrand, 1996; Nunn and van Nostrand, 1996a). The field camp, at cabins on Muskrat Lake in the Mealy Mountains, was also shared by R. Emslie,

following up on aspects of his 1975 investigations in the Mealy Mountains.

3.5 PROVINCIAL FUNDING (1996–2000)

No systematic mapping was carried out in 1996, partly because of the author’s involvement in an international conference held in Goose Bay 29th July – 2nd August (IGCP Project 309–COPENA), which also featured pre- and post-conference field excursions in various parts of Labrador, including one along the southeast coast.

Mapping resumed in 1997, and was the first of four consecutive projects that completed the mapping of NTS map area 13B (Gower, 1998, 1999, 2000, 2001). This is a very poorly exposed region, so all work was carried out by helicopter spot checks, apart from (generally short) ground traverses along well-exposed river sections. One exception was mapping along the middle Eagle River in 1997, which was done using an inflatable boat. In 1997, base camp was at a cabin on Byrne Lake; in 1998, during mapping of NTS map area 13B/northwest, camp was at Brennan Lake, south of Goose Bay. The camp and helicopter were shared with colleague D. James, who mapped the adjacent area to the west (NTS map area 13C/northeast). In 1999, during mapping of NTS map area 13B/southeast, camp was based in Rivière St Paul, and in 2000 a base camp was established in Goose Bay and a ‘forward’ tent camp was set up in the field area, which was then occupied for one or two nights at a time. Although helicopter commuting from outside the field area may seem like an expensive luxury, costs were lower than they would have been had a full tent camp been set in the area, and personnel, provisions, equipment and fuel delivered to it.

3.6 PROVINCIAL FUNDING (POST 2000)

After 2000, mapping contributing to the geological map of eastern Labrador mainly involved examination of roadcuts and quarries created during construction of the Trans-Labrador Highway and its spur roads to various communities. This was done in 2003, 2004, 2005, 2007, 2008, 2009 and 2010, adding over 1000 additional data stations to the database. Some outcrops no longer exist due to subsequent landscaping. Brief helicopter-supported forays were also made in the Mealy Mountains.

3.7 COMMENTS REGARDING MAPPING

Although a non-geologist might consider that once an area has been mapped geologically and a factual record has been made of the rocks present, there is no subsequent need to remap the region. Earth scientists, especially those in geo-

logical mapping, know that this is far from the case. For eastern Labrador, foremost to be kept in mind is that the geological mapping is at reconnaissance level only, and, even if mapped at an order-of-magnitude larger scale, it would still be less detailed than available in many developed parts of the world. Furthermore, newly evolving concepts and techniques inevitably require the rocks to be re-examined in the field to search for features that were previously ignored or had unrecognized significance. One obvious example of the latter in eastern Labrador is kinematic data, which were largely

neglected until the mid-1980s, and, even subsequently, collected far more sparsely than desirable.

Geological survey mapping focusses on the questions what a rock is, where it is located, and when it formed. The questions of why and how it formed tend to be the realm of university research. The recent 1:100 000-scale geological maps for eastern Labrador provide a basic framework regarding the first three questions and a platform from which to address the last two.